

# Lunar Soil Particle Separator, Phase II

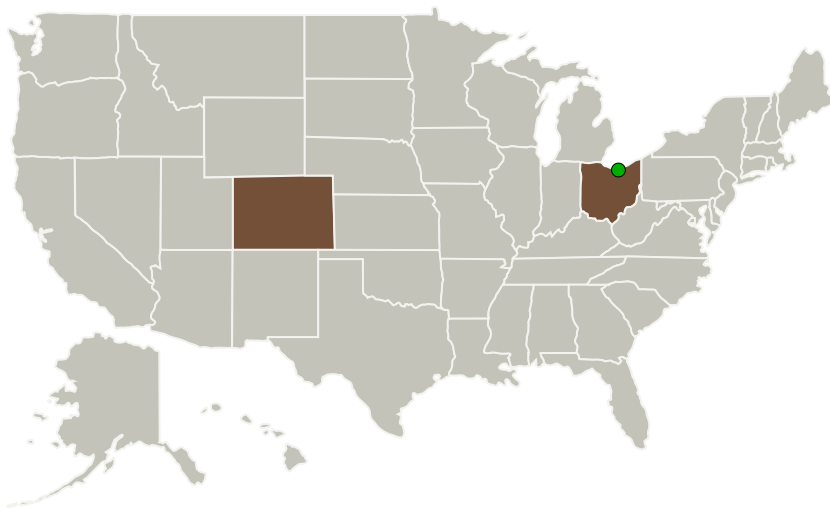
Completed Technology Project (2010 - 2012)



## Project Introduction

The Lunar Soil Particle Separator (LSPS) is an innovative method to beneficiate soil prior to in-situ resource utilization (ISRU). The LSPS can improve ISRU oxygen yield by boosting the concentration of ilmenite or other iron-oxide bearing materials found in lunar soils. This can substantially reduce hydrogen reduction reactor size and drastically decrease the power input required for soil heating. LSPS particle size separations can be performed to de-dust regolith and to improve ISRU reactor flow dynamics. LSPS mineral separations can be used to alter the sintering characteristics of lunar soil. The LSPS can also be used to separate and concentrate lunar minerals useful for manufacture of structural materials, glass, and chemicals. The LSPS integrates an initial centrifugal particle size separation with magnetic, gravity, and electrostatic separations. The LSPS centrifugal separation method overcomes the reduced efficiency of conventional particle sieving in reduced gravity. The LSPS hardware design integrates many individual unit operations to reduce system mass and power requirements. The LSPS is applicable to ISRU feed processing as well as robotic prospecting to characterize soils over wide regions on the Moon. The LSPS is scalable and is amenable to testing and development in vacuum and reduced gravity.

## Primary U.S. Work Locations and Key Partners



Lunar Soil Particle Separator,  
Phase II

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Organizations Performing Work	Role	Type	Location
Pioneer Astronautics	Lead Organization	Industry Historically Underutilized Business Zones (HUBZones)	Lakewood, Colorado
● Glenn Research Center(GRC)	Supporting Organization	NASA Center	Cleveland, Ohio

## Primary U.S. Work Locations

Colorado	Ohio
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## Project Transitions

**January 2010:** Project Start**January 2012:** Closed out

## Closeout Documentation:

- Final Summary Chart(<https://techport.nasa.gov/file/139197>)

## Organizational Responsibility

**Responsible Mission Directorate:**

Space Technology Mission Directorate (STMD)

**Lead Organization:**

Pioneer Astronautics

**Responsible Program:**

Small Business Innovation Research/Small Business Tech Transfer

## Project Management

**Program Director:**

Jason L Kessler

**Program Manager:**

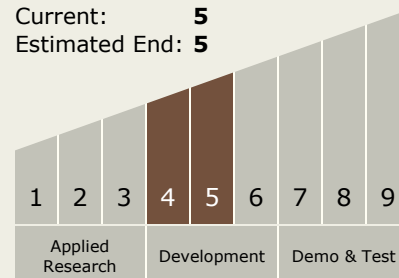
Carlos Torrez

**Principal Investigator:**

Mark Berggren

## Technology Maturity (TRL)

Start: 4  
Current: 5  
Estimated End: 5



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### Technology Areas

#### Primary:

- TX07 Exploration Destination Systems
  - └ TX07.1 In-Situ Resource Utilization
    - └ TX07.1.2 Resource Acquisition, Isolation, and Preparation

### Target Destinations

The Sun, Earth, The Moon, Mars, Others Inside the Solar System, Outside the Solar System